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ABSTRACT

An instructor's manual and student activity guide on the weaver's knot are provided in this set of prevocational education materials which focuses on the vocational area of trade and industry (textiles). (This set of materials is one of ninety-two prevocational education sets arranged around a cluster of seven vocational offerings: agriculture, home economics, distributive education, health occupations, world of work, trade and industry, and office occupations.) The instructor's guide contains the following elements: title of activity, duration of activity (three to six periods), activity goals, three instructional objectives, related vocational clusters, and activity implementation (description, safety precautions, materials needed, teacher preparation prior to class, during the class, follow-up activities, answer keys, and masters for duplication). The student activity guide provides step-by-step instructions (narrative and illustrations) for completing each instructional objective. At the end of each set of instructions is a student check point (evaluation activity). Fourteen occupational descriptions (e.g., weaving supervisor, cloth-grade supervisor, creeler) conclude the document. (JH)

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ED169381

T & I – TEXTILES, WEAVER'S KNOT

Kit No. 92

INSTRUCTOR'S MANUAL

Prepared by

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State Department of Education
Office of Vocational Education
Prevocational Education
Columbia, South Carolina 29201

In Cooperation With

Vocational Education Media Center
Clemson University
Clemson, South Carolina 29631

1978

CE 020 566

U.S. DEPARTMENT OF HEALTH
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TITLE OF ACTIVITY

Kit No. 92, T & I – Textiles, Weaver's Knot

DURATION

Main Activity: 2 – 4 periods
Follow-up Activity: 1 – 2 periods

GOALS

The student will understand some of the terms and tasks preformed by people in the textile industry.

INSTRUCTIONAL OBJECTIVES

Given proper information, students will determine the difference between material and synthetic fibers.

After viewing various machines and equipment, each student will identify various pieces of equipment used by the textile industry.

Given proper instruction, students will demonstrate their ability at tying a weaver's knot. This is a task often performed by a weaver.

VOCATIONAL CLUSTERS

DE, Agriculture

ACTIVITY IMPLEMENTATION

A. Description

This activity identifies some of the major machines and equipment used by the textile industry, identifies natural and synthetic fibers, and gives step-by-step instructions on tying a weaver's knot. Students will perform the task of tying a weaver's knot. An overview filmstrip of the textile industry aids in the presentation of this activity. After viewing the filmstrip, each student will have an understanding of the textile manufacturing processes.

B. Safety

No special precautions

C. Materials Required

1. Audio Visual Equipment:

   Filmstrip projector
   Screen
   Cassette player

2. Technical Equipment:

   None

3. Expendable Materials:

   6 in. (15 cm) of black yarn for each student
   6 in. (15 cm) of white yarn for each student

D. Preparation Prior to Class

Duplicate answer sheets 1 and 2, and the VIEW Fact Sheet for each student.

Obtain the proper amount of black and white yarn.

E. During Class Session

Introduction

Textiles is a very large industry. Many people throughout the United States are involved with some phase of textile production. This activity will explain some of the jobs, processes and machines used in this industry.

F. Follow-up Activities

1. Have each student complete a VIEW Fact Sheet.
2. Visit local area vocational center textile class or textile plant.
3. Obtain local career opportunities by checking the want ads of a newspaper.

ANSWER KEY

Objective 1

1. natural
2. synthetic
3. synthetic
4. natural
5. synthetic
6. natural
7. synthetic
8. synthetic
9. synthetic
10. natural
11. synthetic
12. natural
13. natural
14. synthetic
15. natural

Objective 2

1. spooler – J
2. roving frame – I
3. cotton gin – H
4. opening machine – G
5. mechanical cotton picker – F
6. slasher – E
7. creel – D
8. loom – C
9. spinning frame – B
10. card – A

MASTERS FOR DUPLICATION

1. VIEW Fact Sheet
2. Answer Sheet No. 1
3. Answer Sheet No. 2

VIEW FACT SHEET

NAME _____ CLASS _____ OCCUPATION _____

A. List the advantages (good points) of this occupation (job).

B. List the disadvantages (bad points) of this occupation (job).

C. List three things you should know to do this occupation (job).
1.
2.
3.

D. What type of education should you get to be prepared (do) for this occupation (job)?

E. What courses must you take to go into this occupation (job)?

F. What do you think your future in this occupation (job) will be?

G. What wage can you expect in this occupation (job)?

H. What are the working hours of this occupation (job)?

I. To learn more about this occupation (job), write to:

J. Using a scale of 1 to 5, circle the number that measures your interest in this occupation (job) as a possible career.

C

ANSWER SHEET 1

Label each item either synthetic or natural fibers.

1. Wool _____
2. Nylon _____
3. Rayon _____
4. Cotton _____
5. Kodell _____
6. Mohair _____
7. Dacron _____
8. Arnel _____
9. Orlon _____
10. Flax _____
11. Fortrel _____
12. Jute _____
13. Asbestos _____
14. Creslan _____
15. Silk _____

STUDENT ANSWER SHEET 2

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

A. Cards

B. Spinning frames

C. Looms

D. Creel

E. Slasher

F. Mechanical cotton picker

G. Opening machines

H. Cotton gin

I. Roving frame

J. Spooler

T & I – TEXTILES, WEAVER'S KNOT

Kit No. 92

STUDENT

ACTIVITY GUIDE

Prepared by

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State Department of Education
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INTRODUCTION

Textiles is a very large industr . Many people throughout the United States are involved with some phase of textile production. This activity will explain some of the jobs, processes and machines used in this industry.

GOALS

Students will understand some of the terms and tasks performed by people in the textile industry.

DIRECTIONS

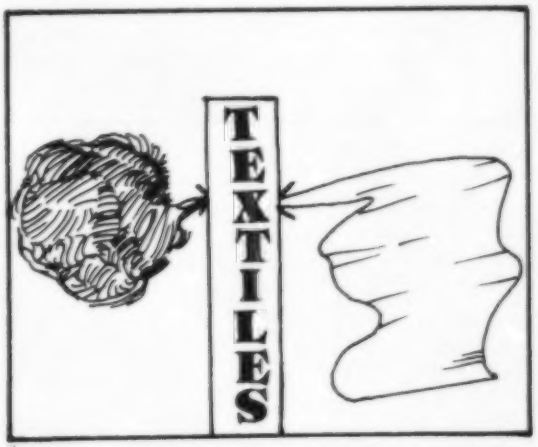
Carefully read each objective, step and checkpoint. Do not proceed to a new objective unless you have successfully completed the checkpoint. Ask your instructor for aid if any problems arise.

MATERIALS

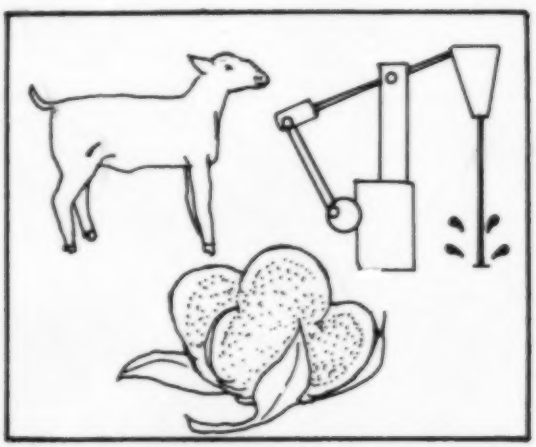
Answer Sheet No. 1
Answer Sheet No. 2
1 piece of white yarn 6 in. (15 cm)
1 piece of black yarn 6 in. (15 cm)

Instructional Objective 1

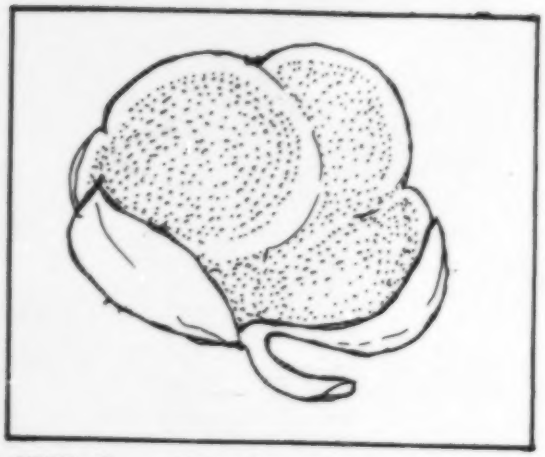
Given proper information, students will determine the difference between natural and synthetic fibers.



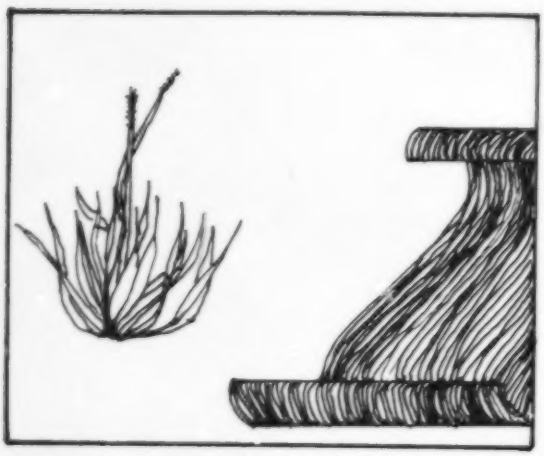
STEP 1 – The textile industry purchases natural and synthetic fibers and processes them into yarns and cloth.



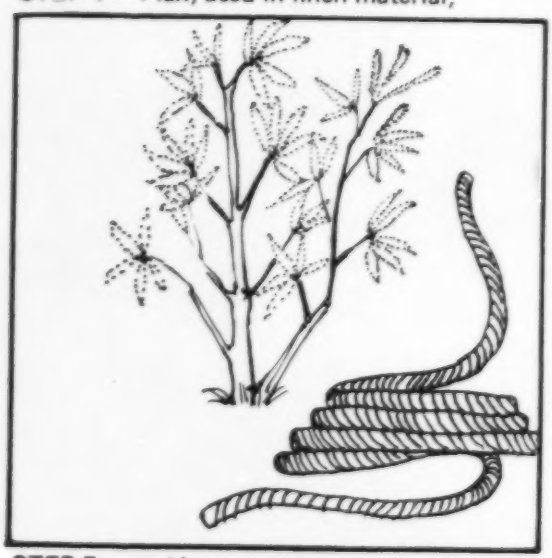
STEP 2 – Materials obtained from nature are referred to as natural fibers. They are classified as vegetable, animal, and mineral fibers.



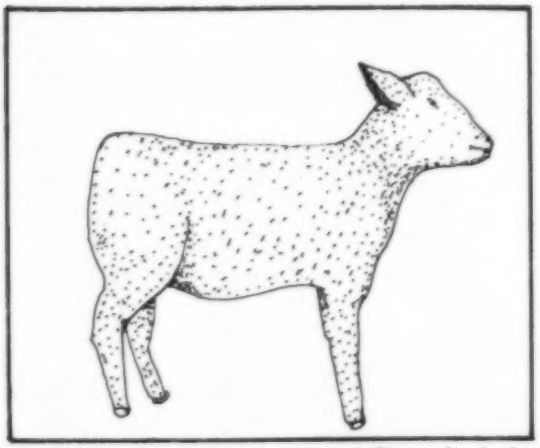
STEP 3 – Examples of vegetable fibers include cotton, used in clothing,



STEP 4 – Flax, used in linen material,

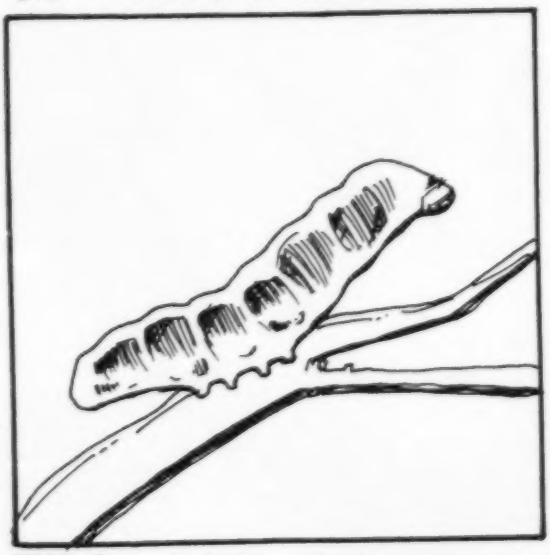


STEP 5 – and jute, used in rope.



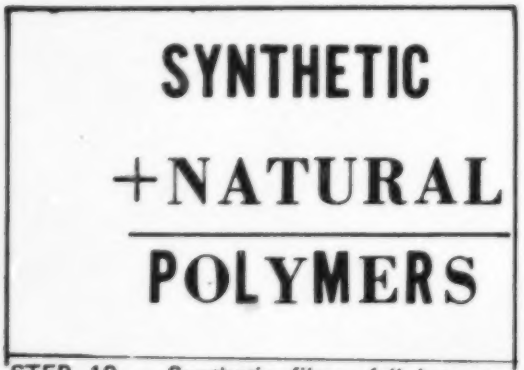
STEP 6 – Examples of animal fibers include wool, used in clothing,

STEP 7 – Mohair, used in sweaters,

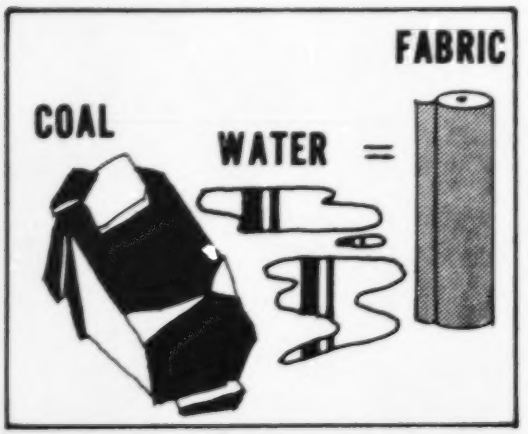


STEP 8 – And silk, used in scarves and expensive clothing.

STEP 9 – An example of a mineral fiber is asbestos, used in heat protective clothing.

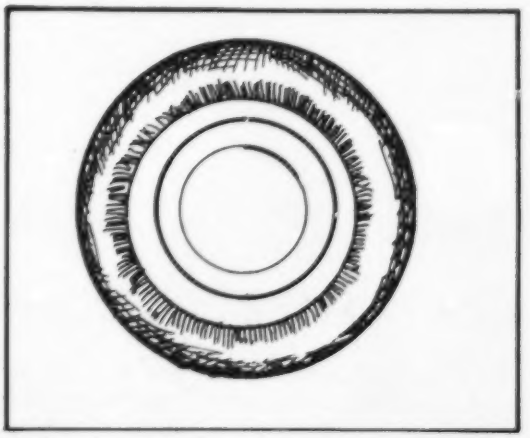


STEP 10 – Synthetic fibers fall into two categories: natural polymers or synthetic polymers.

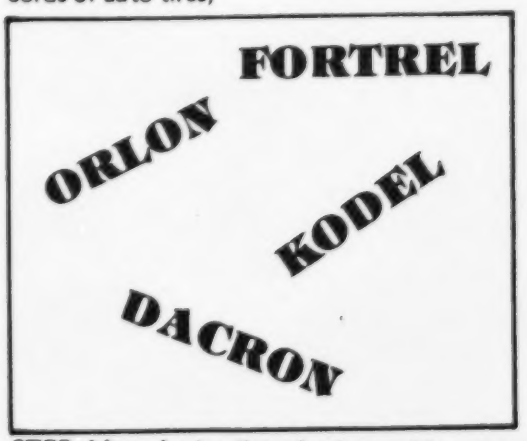


STEP 11 – Both natural and synthetic polymers are produced by chemical compounds. The chemistry of either fiber is completely different from the original natural substance. For example, many natural polymers are produced using coal, air and water. The final fiber does not look like its original substance.

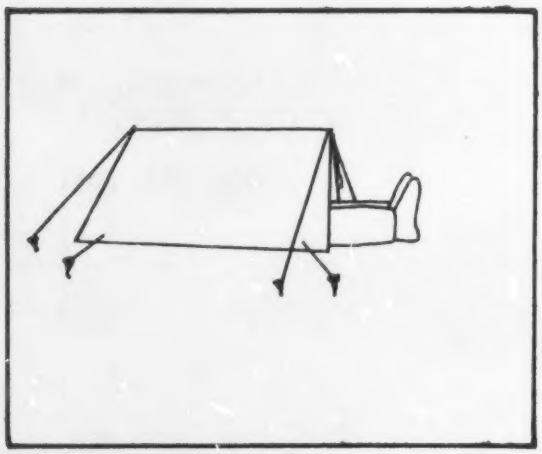
STEP 12 – Examples of natural and synthetic polymers are Nylon, used in hosiery items,



STEP 13 – Rayon and fiberglass, used in the cords of auto tires;



STEP 14 – And a list of others with names like acetate, Arnel (Celanese), Orlon (DuPont), Creslan (Amer. Cyanimid), Dacron (DuPont), Fortrel (Fiber Industries), and Kodel (Eastman), used in a variety of ways from clothing to. . .



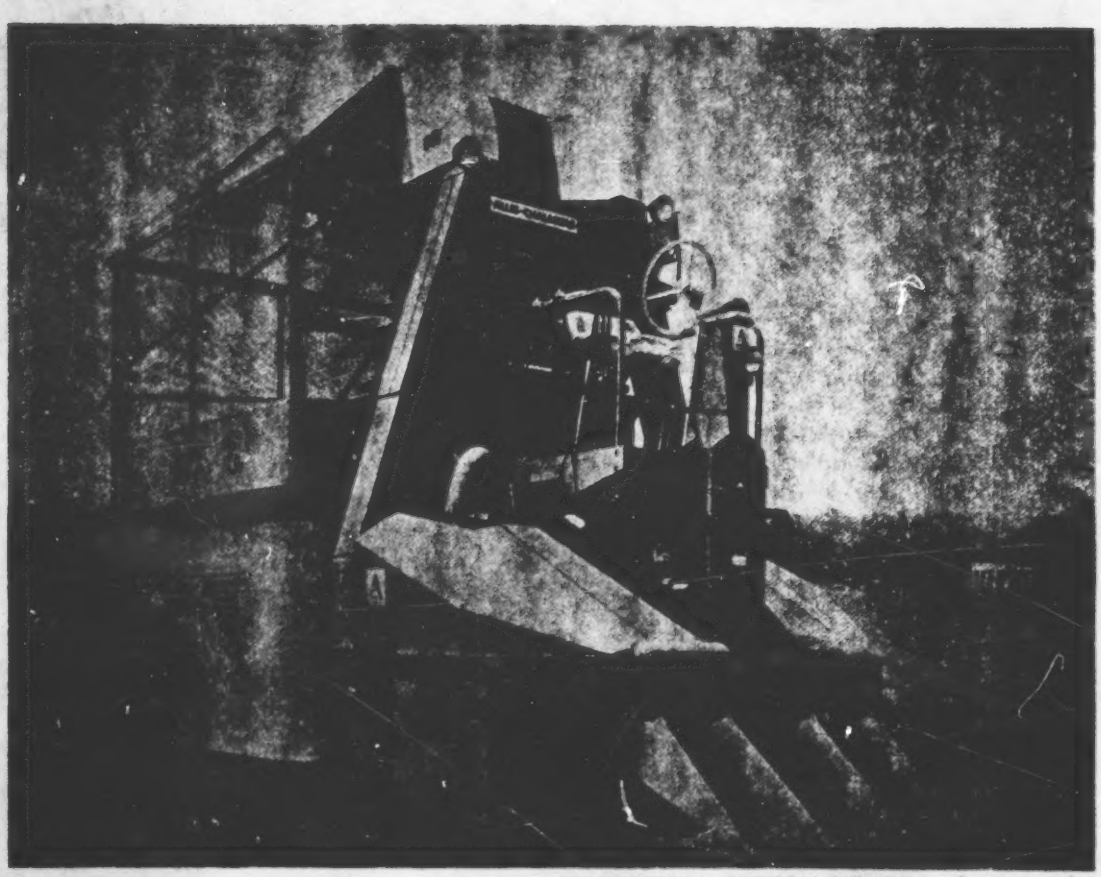
STEP 15 – camping items.

Check Point

Using the answer sheet given to you by your instructor, complete the matching items identifying synthetic fibers and natural fibers.

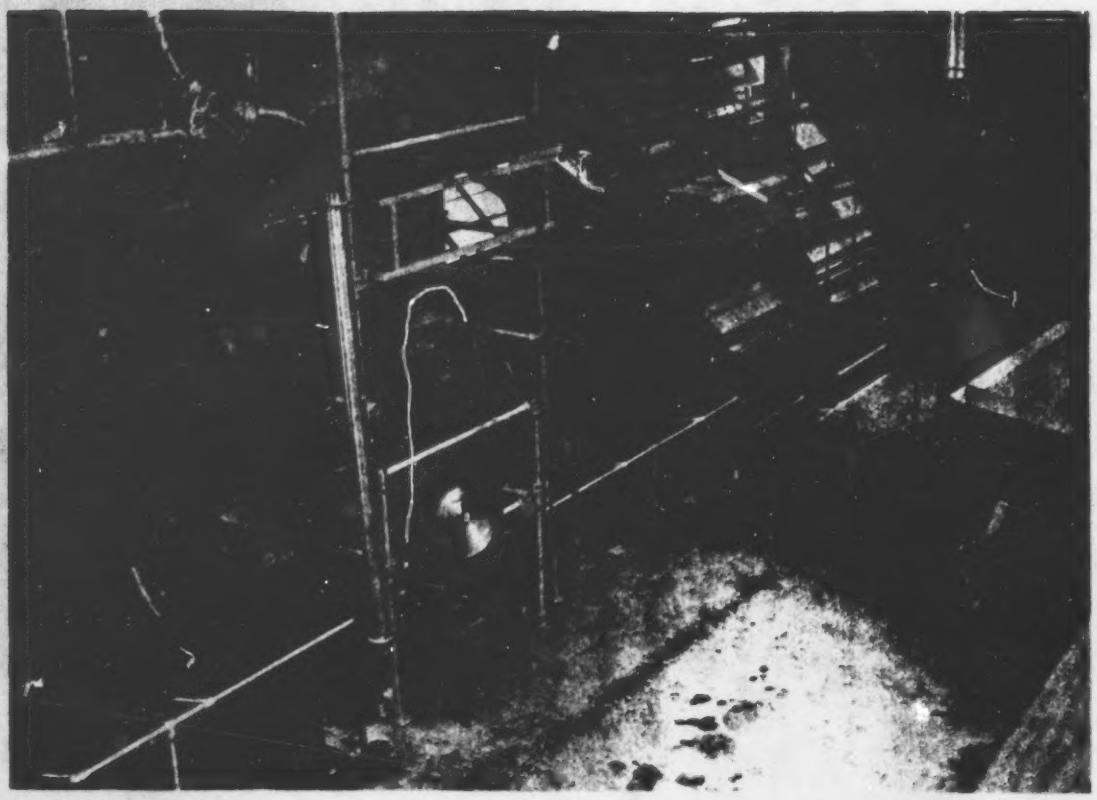
Instructional Objective II

After viewing various machines and equipment, each student will identify various pieces of equipment used by the textile industry.



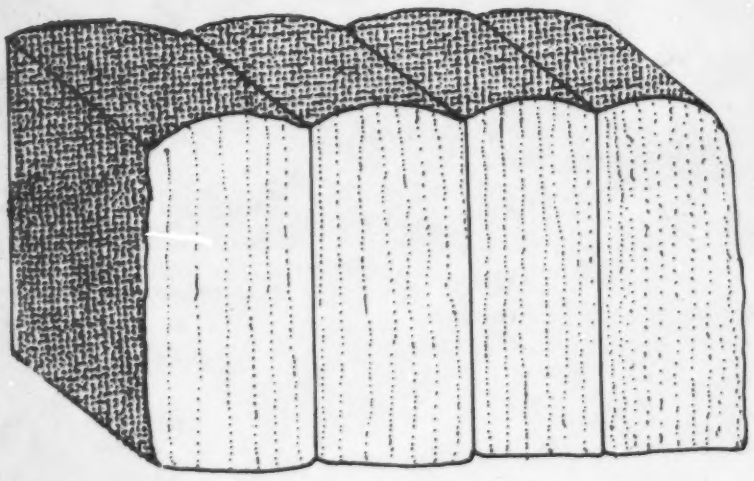
MECHANICAL COTTON PICKER — Courtesy of United States Department of Agriculture

STEP 1 — The mechanical cotton picker is a machine used to remove the cotton boll from the cotton plant.

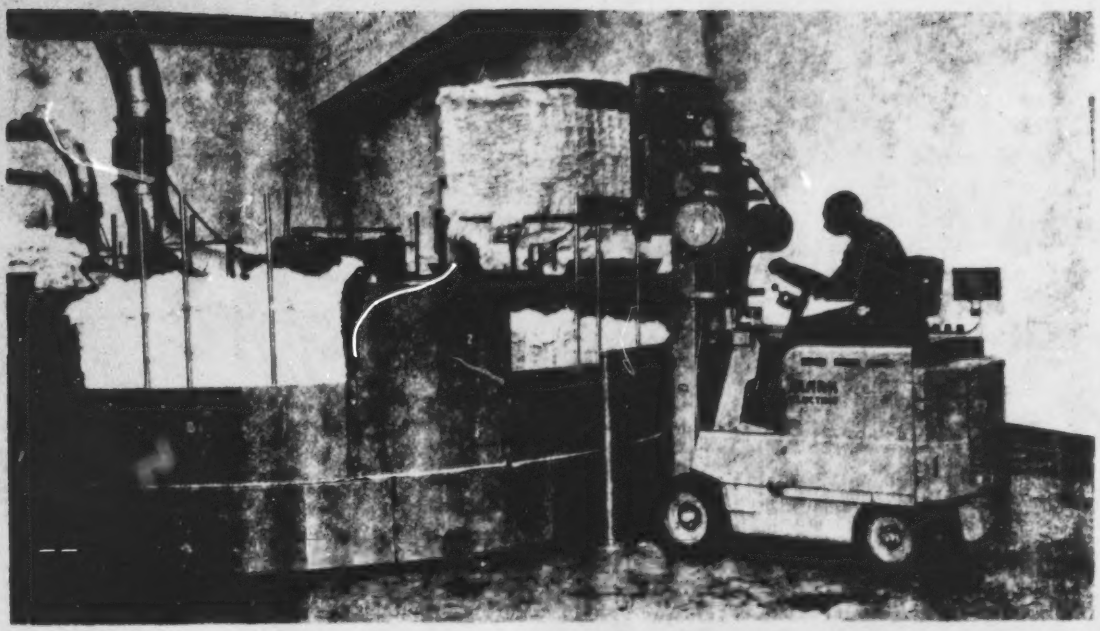


GINNING MACHINERY – Courtesy of United States Department of Agriculture

STEP 2 – Once the cotton boll is picked, it goes through a ginning (cleaning and packaging) process. A group of conveyors, cleaners, dryers, feeders, gin stands and bale processes make up a cotton gin.

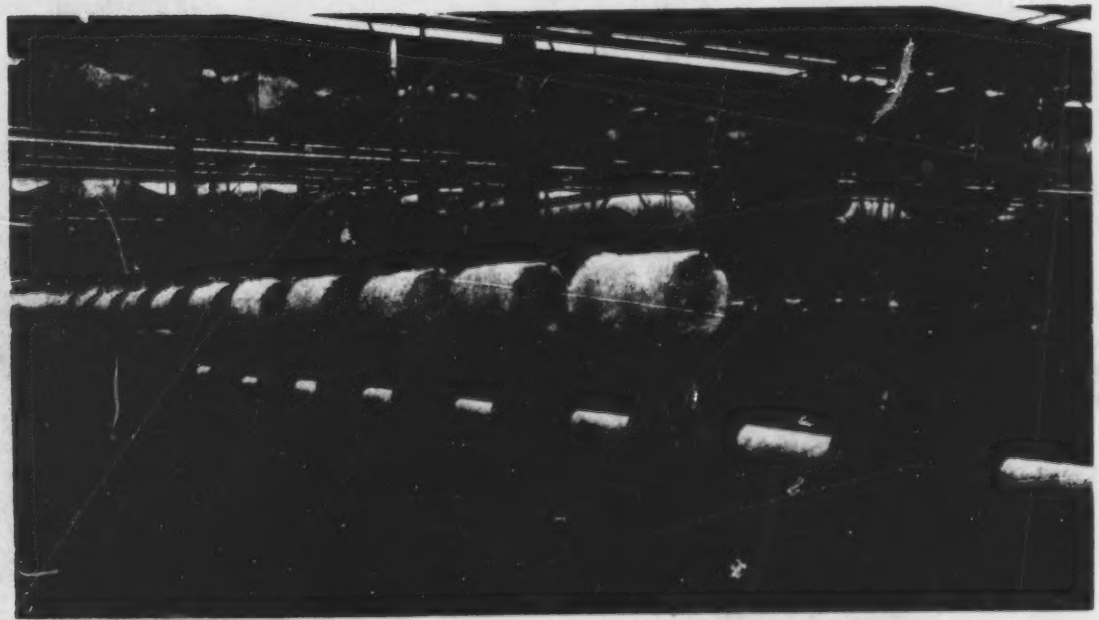


STEP 3 – From the gin, a bale of cotton is purchased to be processed by a textile company.



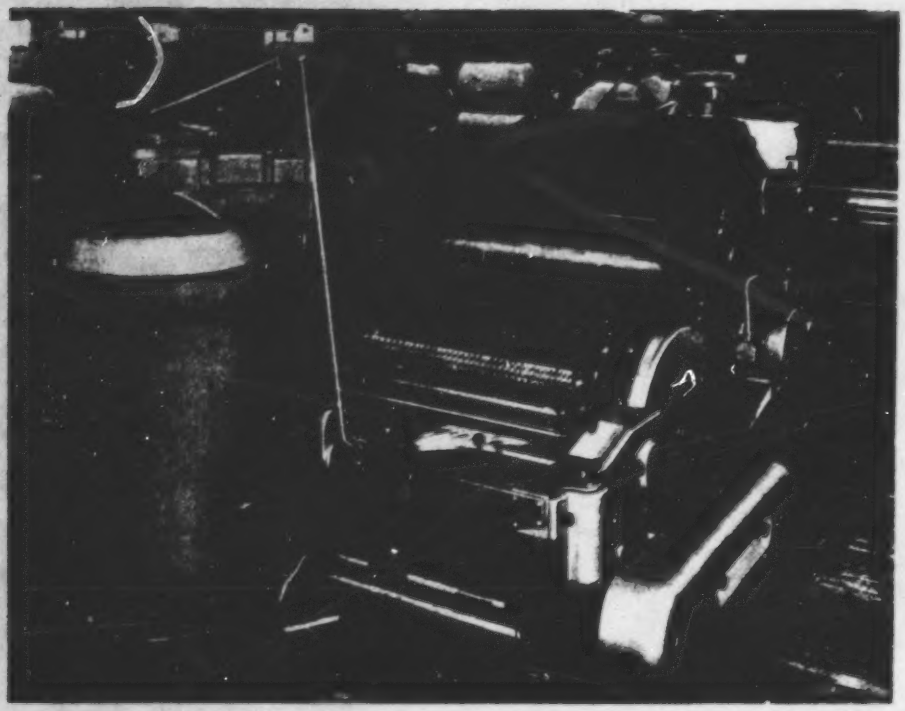
OPENING MACHINE – Courtesy of American Rieter

STEP 4 – Several bales are placed in an automatic opener at the textile plant.



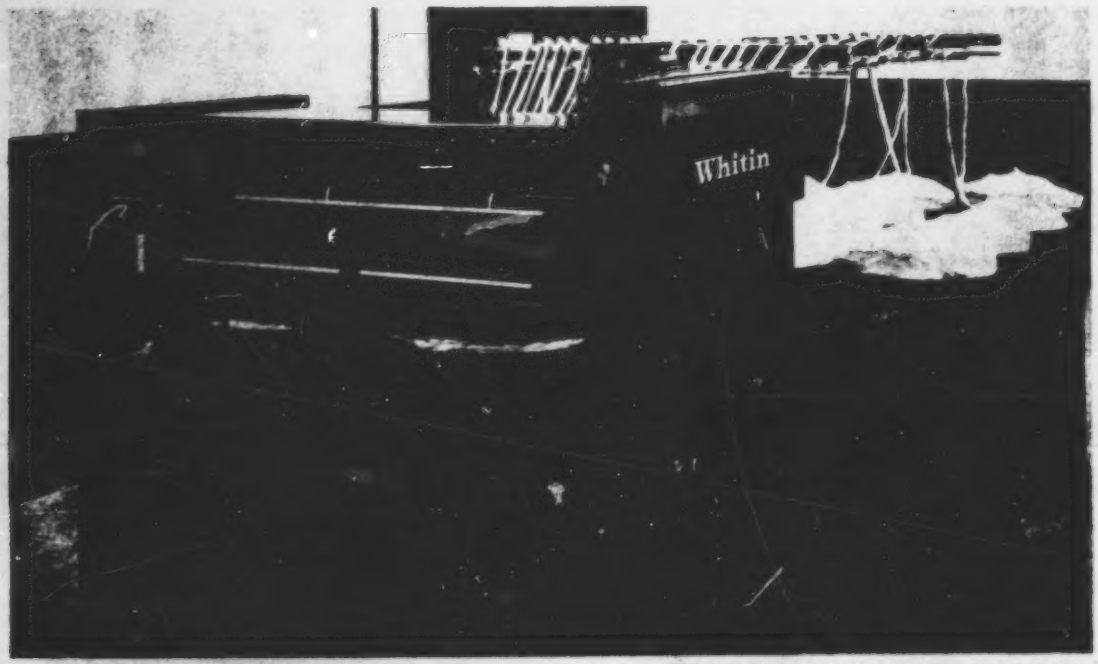
LAP CONVEYING EQUIPMENT – Courtesy of American Monorail

STEP 5 – Fibers are opened and blended together to form a lap in the picking process.



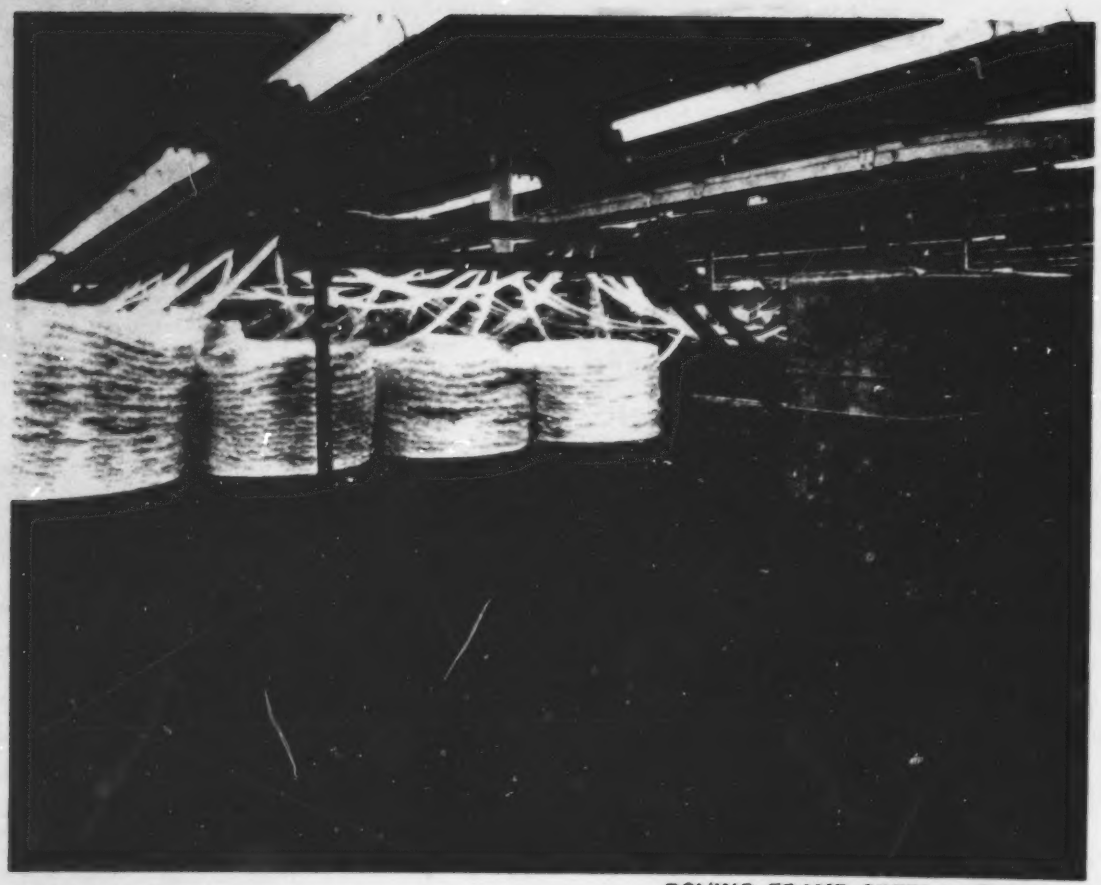
STEP 6 — This lap is then placed on a carding machine where fibers are further drawn apart and made into a sliver.

HIGH PRODUCTION CARD —
Courtesy of Crosrol Carding Developments



STEP 7 — From the card, fiber strands are drawn on the drawing frame.

TWO DELIVERY DRAWING FRAME —
Courtesy of Whitin



STEP 8 – The strand of fiber is then moved to the roving frame and made into a strand called roving.

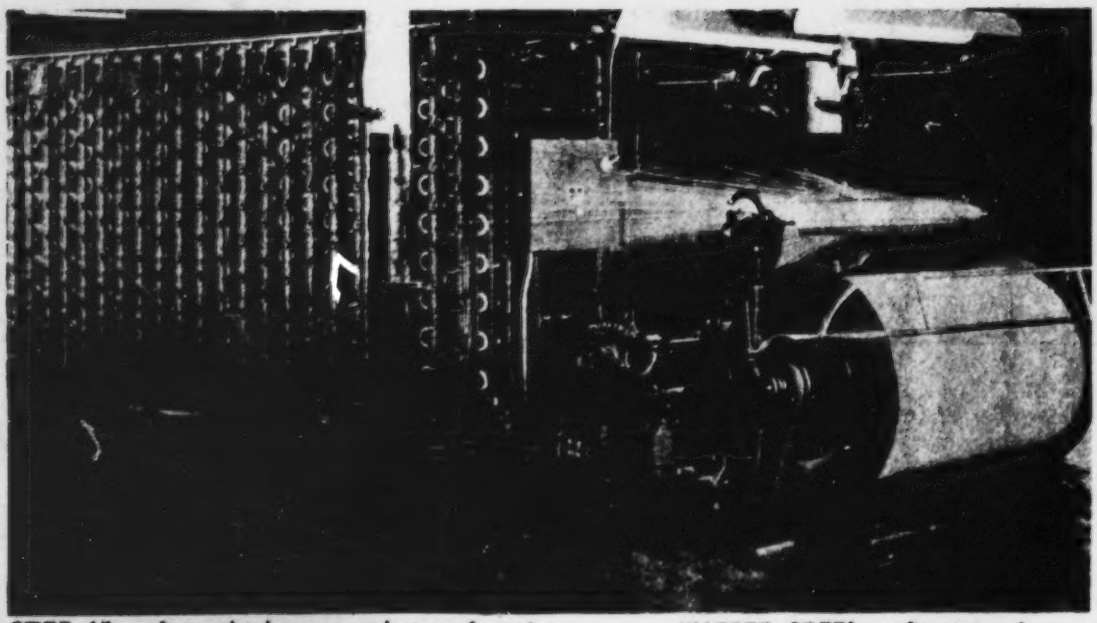
ROVING FRAME CREEL – Courtesy of Saco-Lowell

STEP 9 – Roving is then sent to the spinning frame where the roving is processed into yarn.

SPINNING FRAME – Courtesy of Saco-Lowell

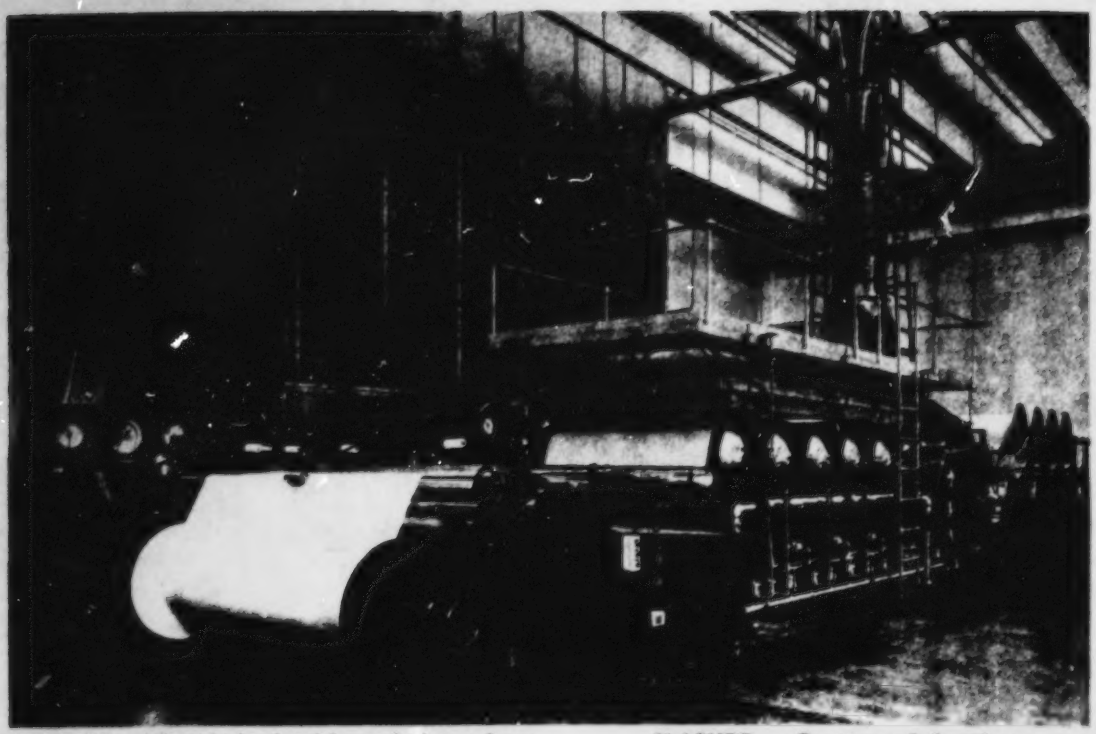
STEP 10 — Once yarn has been made it goes through a group of processes including a spooler where the yarn is put on large spools,

SPOOLER — Courtesy of American Textile Manufacturers Institute



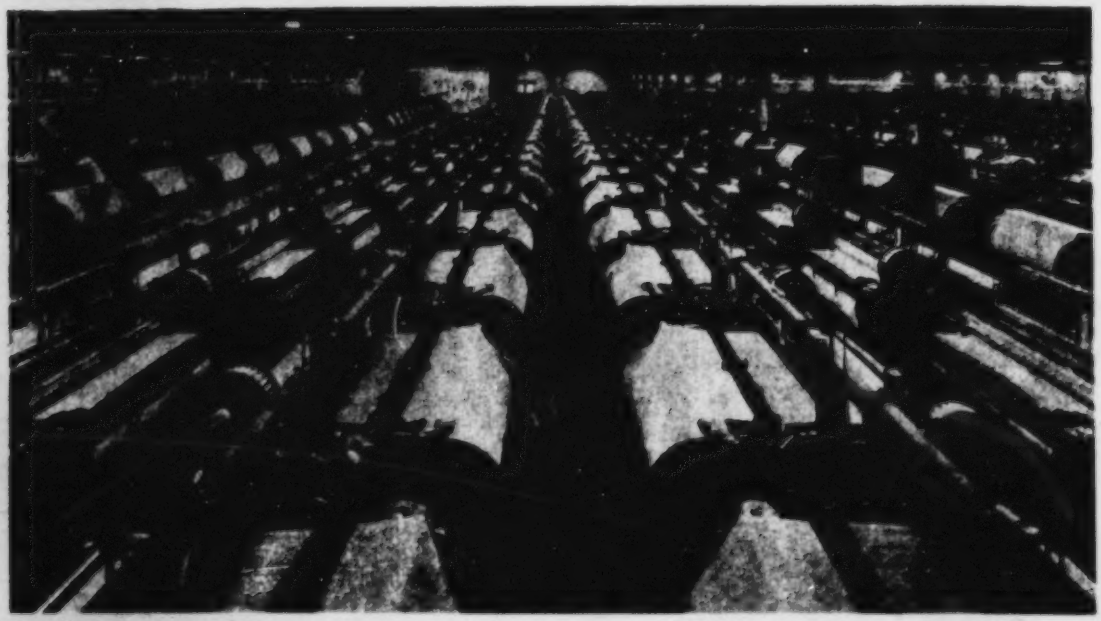
STEP 11 — A creel where yarn is transferred from the spools to a warp beam,

WARPER CREEL — Courtesy of American Textile Manufacturers Institute



STEP 12 — And it is sized in a slasher where heat and starch are added to reduce breakage during the weaving process.

SLASHER — Courtesy of American Textile Manufacturers Institute



STEP 13 — In a textile plant the weave room is filled with looms producing cloth from the yarn produced through these many machines and processes.

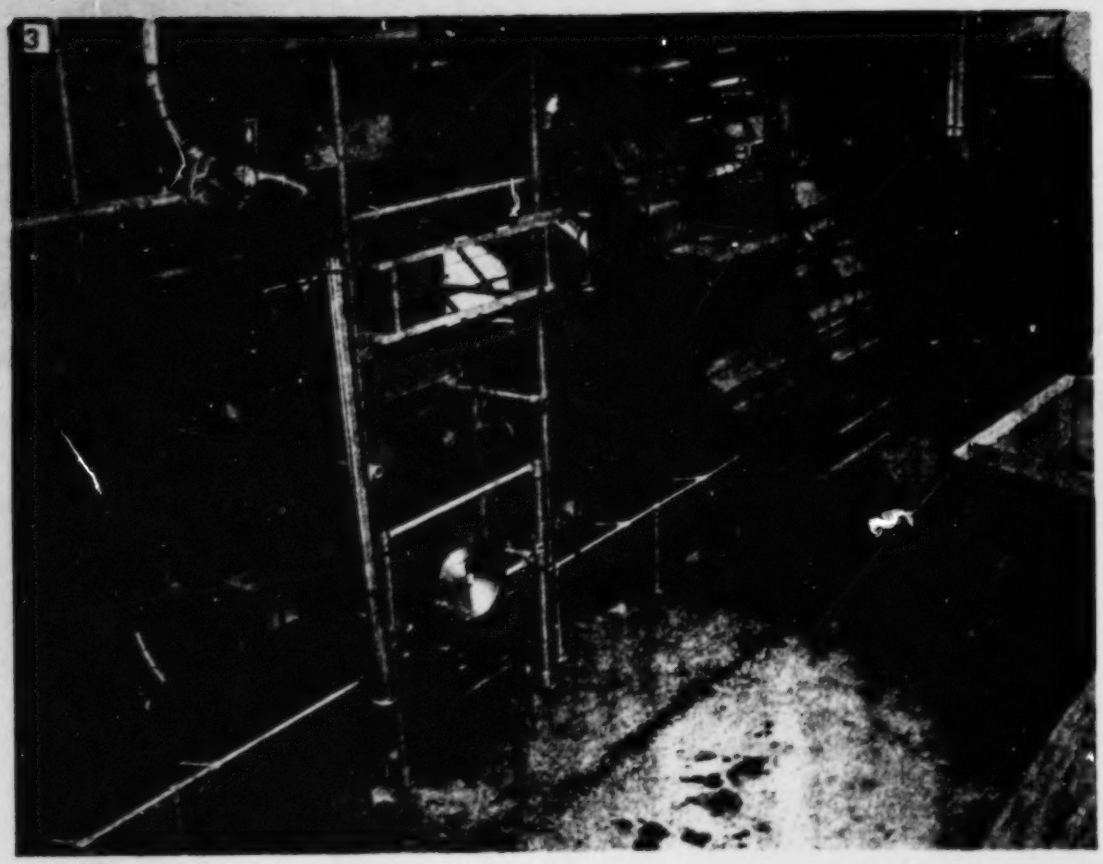
LOOMS — Courtesy of American Textile Manufacturers Institute

Check Point

Using the answer sheet given to you by your instructor complete the matching items by identifying the textile machines with their correct names.

1

2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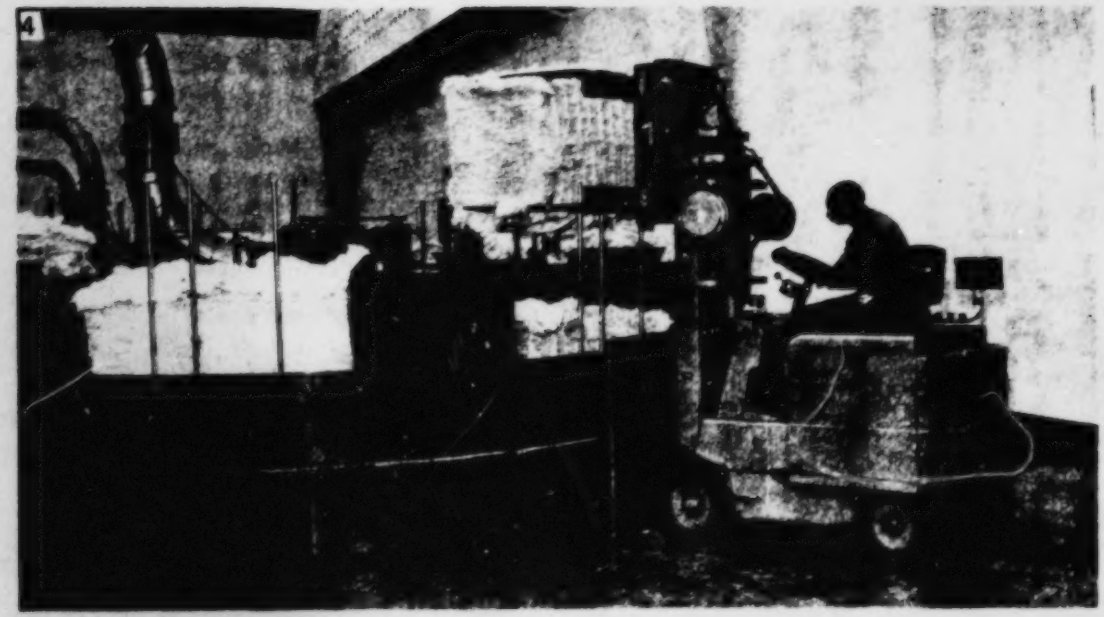
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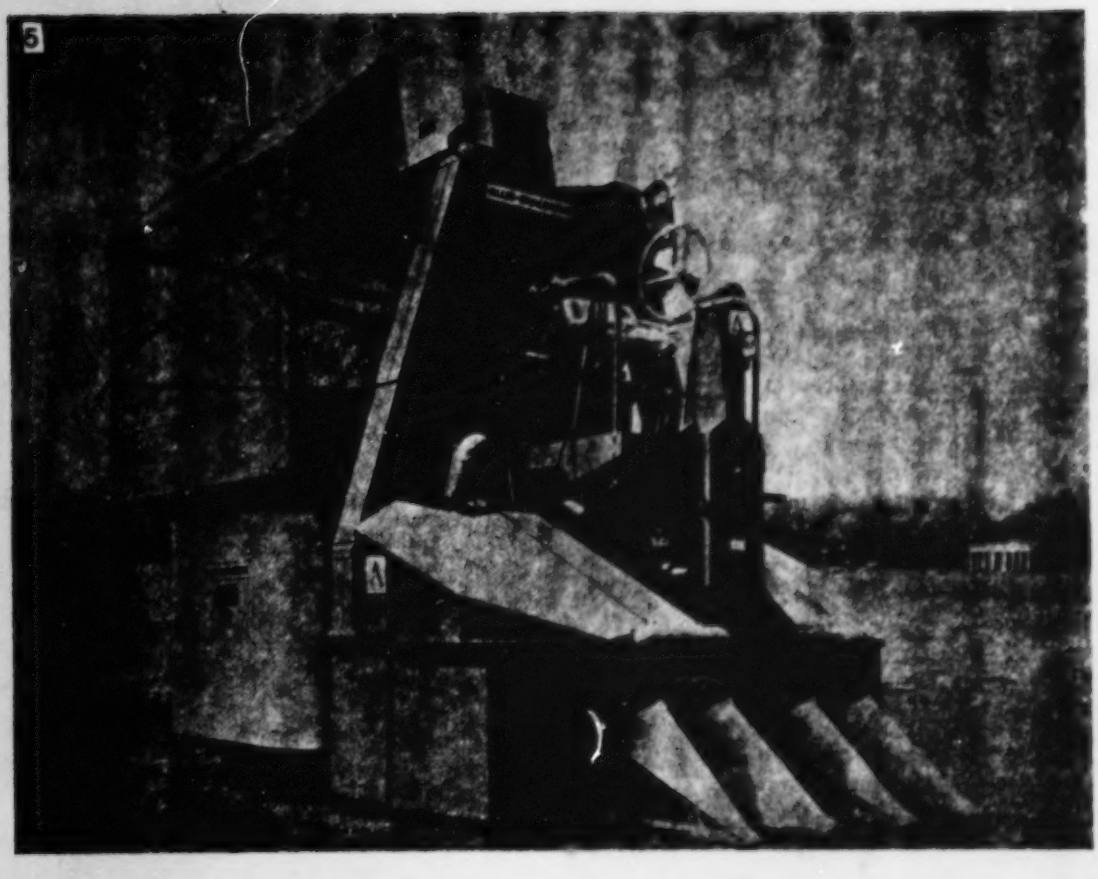
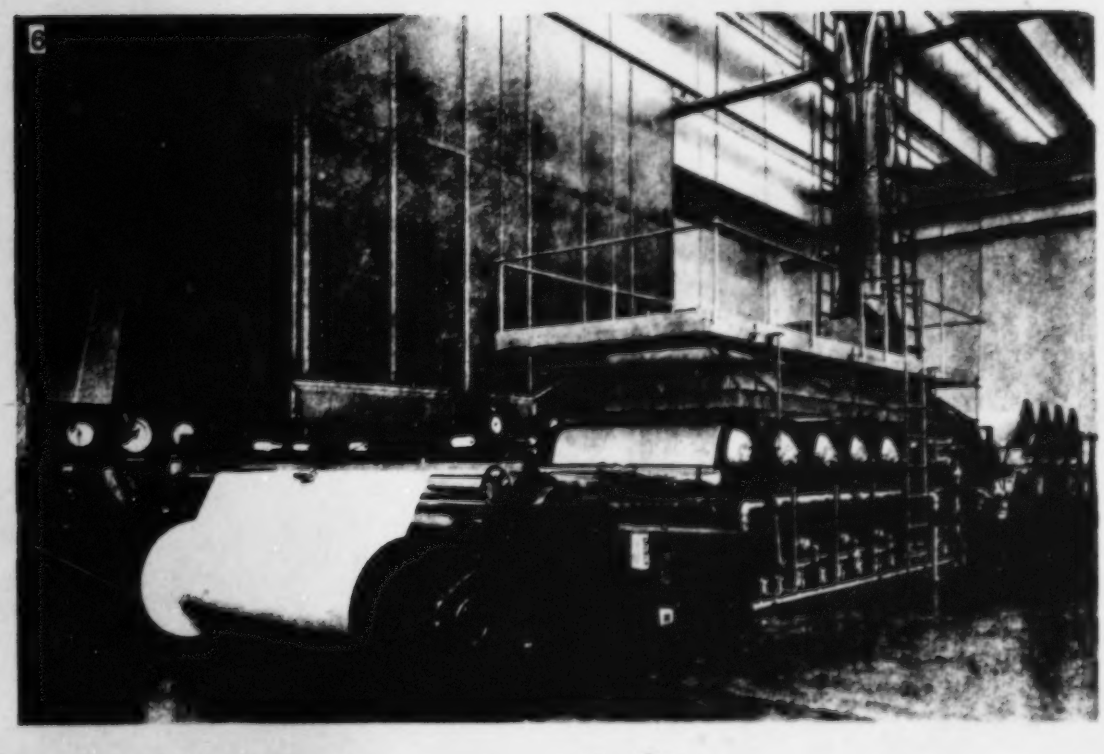
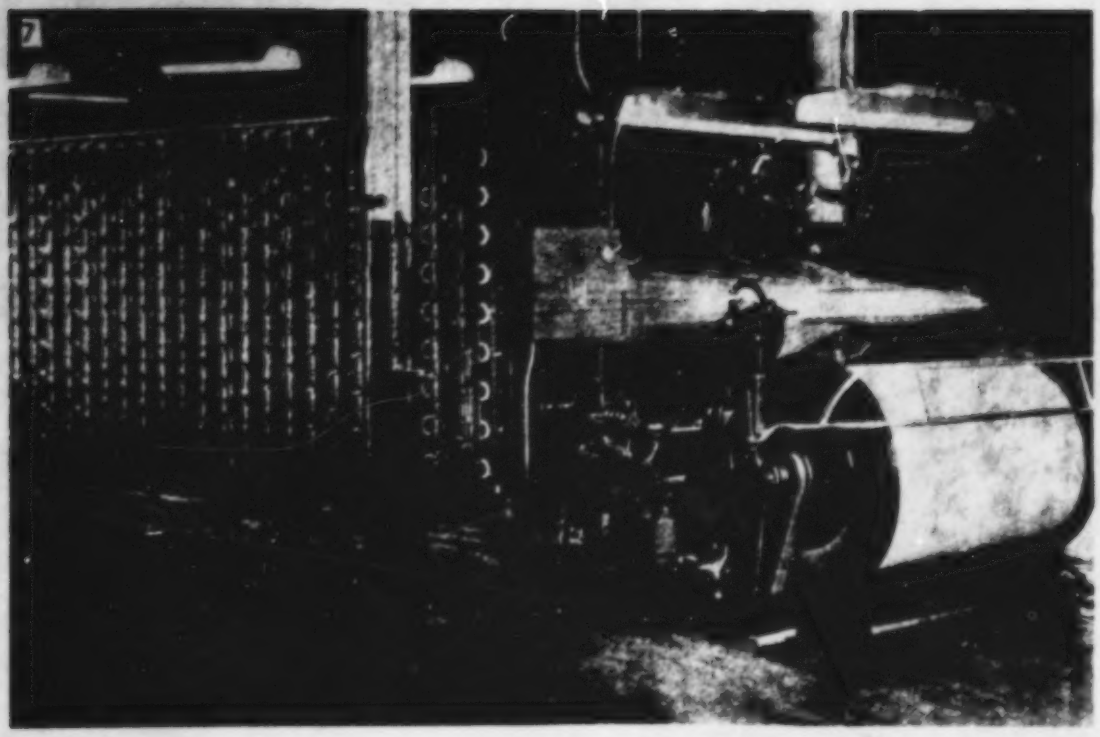
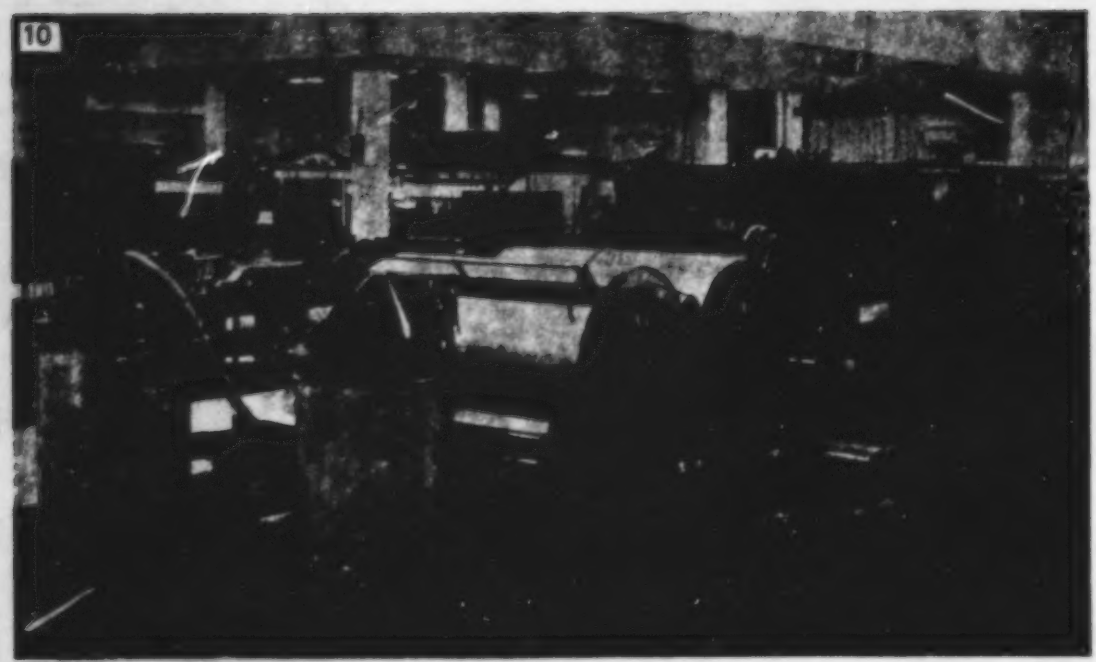





7

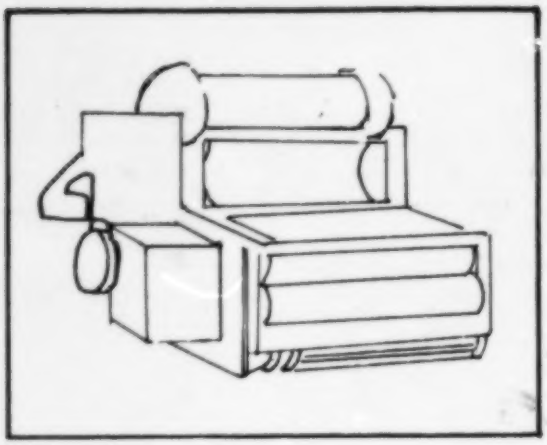
8

9

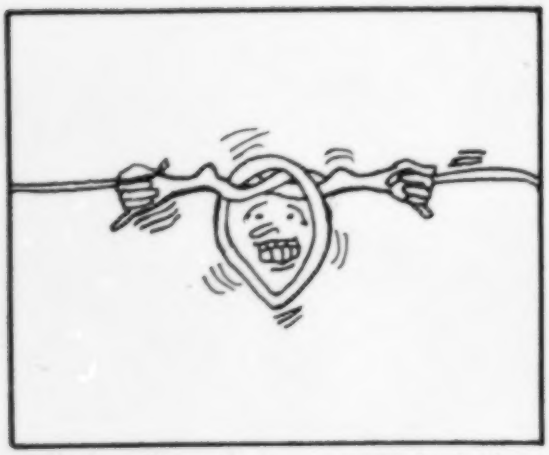

10

Instructional Objective III

Given proper instruction, students will demonstrate their ability at tying a weaver's knot. This is a task often performed by a weaver.

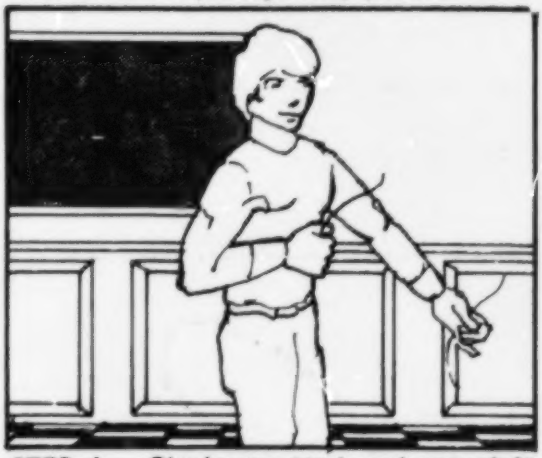


STEP 1 – One tiny broken thread can cause a large machine like this loom to stop.

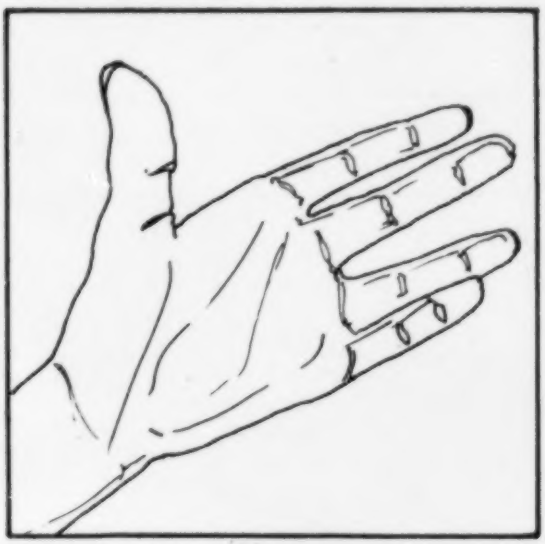


STEP 2 – When a weaver repairs the broken piece of yarn, the knot must be strong enough to withstand the stress of other production processes.

STEP 3 – The weaver's knot is the accepted knot to use in repairing a warp yarn.



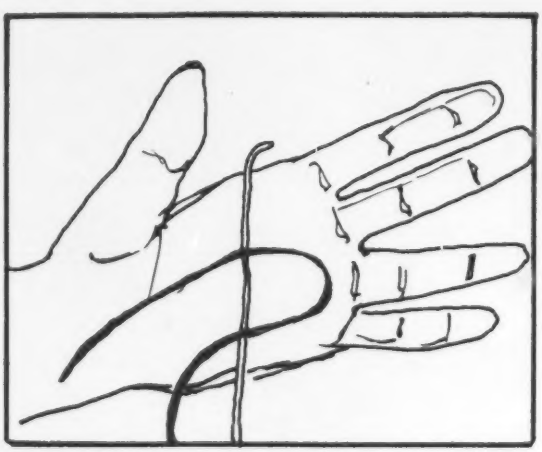
STEP 4 – Obtain one black and one white piece of yarn each 6 inches (15 cm) long.



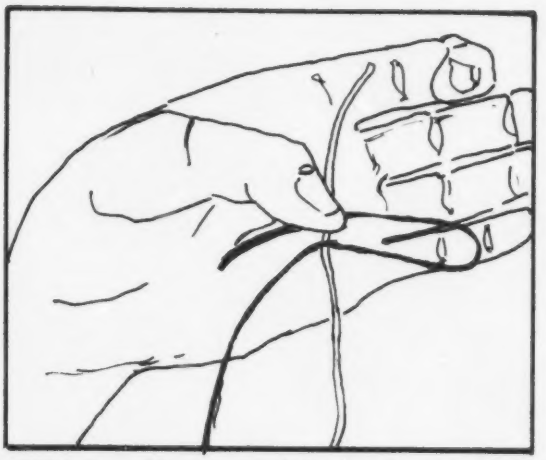
STEP 5 – Hold your left hand open like the illustration above.

STEP 6 – Lay the white yarn across your open left hand.

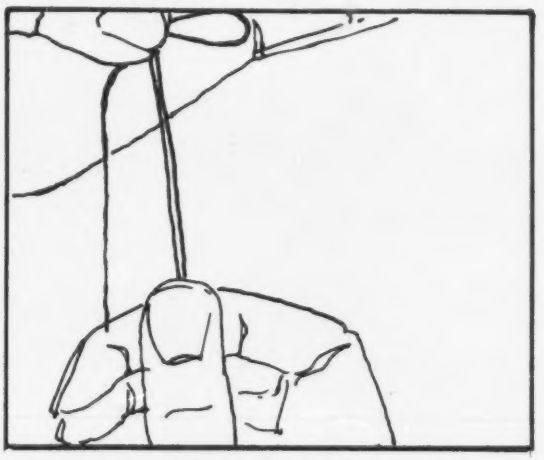
STEP 7 – Form the black yarn into a U-shape.



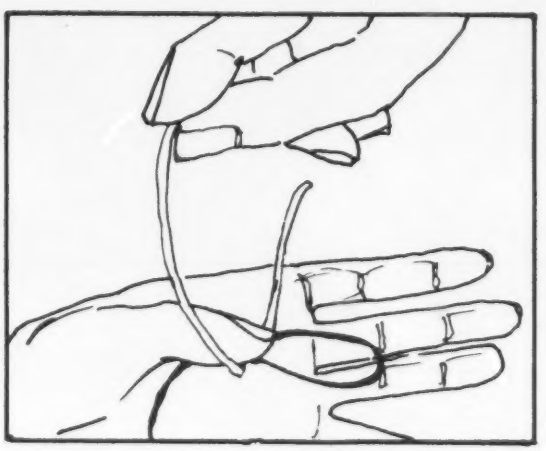
STEP 8 – Lay the black U-shape across the white yarn.



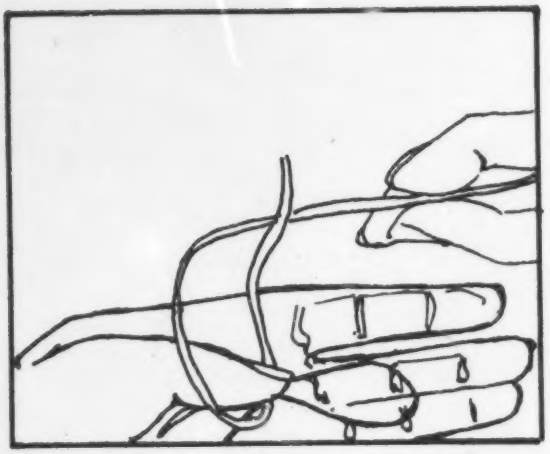
STEP 9 – Move your left thumb and press against the point where the two yarns cross.



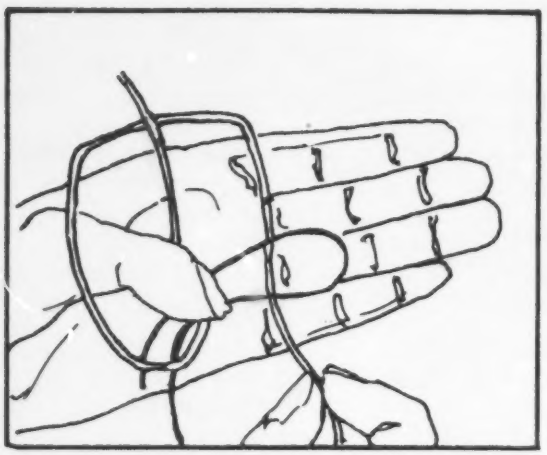
STEP 10 – Using your right hand pick up the lower portion of the white yarn.



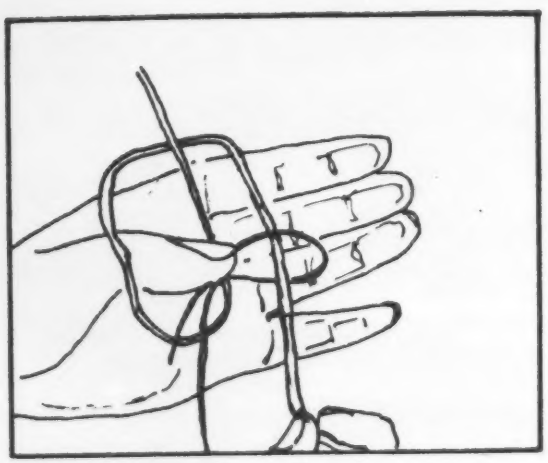
STEP 11 – Wrap the white yarn around your thumb.



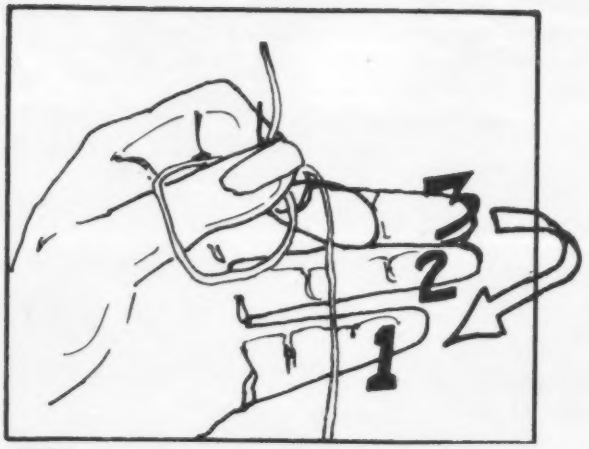
STEP 12 – Move the yarn behind the top portion of white yarn.



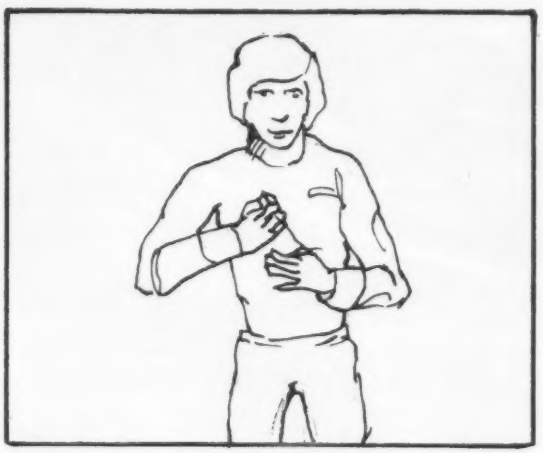
STEP 13 – Locate the white yarn behind the black loop.



STEP 14 – Pull the white yarn through the center of the black loop.



STEP 15 – Clasp your last three fingers over this bottom piece of white yarn,



STEP 16 – and pull the top white yarn end with your right hand to form the weaver's knot.

Check Point

Ask your instructor to inspect the completed knot.

689.130-030 SUPERVISOR, WEAVING (carpet & rug)

Supervises and coordinates activities of workers engaged in creeling, weaving, and rewinding fiber products, such as cloth, rugs, scrim, and binding: Sets up and adjusts looms and winding machines: Directs loom changeover to accommodate new patterns. Inspects in-process and finished materials to insure attainment of specified levels of quality. Performs other duties as described under SUPERVISOR (any ind.).

689.134-010 CLOTH-GRADER SUPERVISOR (textile)

Supervises and coordinates activities of CLOTH GRADERS (textile) engaged in classifying cloth according to number of defects. Trains workers in inspecting and grading cloth according to company standards. Maintains production records. Performs other duties as described under SUPERVISOR (any ind.).

689.134-018 SUPERVISOR, PRODUCT INSPECTION (textile)

Supervises and coordinates activities of workers engaged in inspecting textile products for weaving, printing, and finishing defects: Trains workers in work methods and procedures. Examines malfunctioning machines and requisitions replacement for defective equipment. May supervise packaging of products [PACKAGING SUPERVISOR (any ind.)]. Performs other duties as described under SUPERVISOR (any ind.).

689.260-010 MACHINE FIXER (textile) fixer; machine repairer.

Sets up, and adjusts yarn-manufacturing and processing machines, using charts, oral instructions, and knowledge of machine operation: Changes and adjusts gears, pulleys, rollers, thermal units, *false-twist spindles,* and guides according to type of sliver or yarn processed, type of wind, *draft,* or number of twists per inch, using handtools. Verifies adjustments, using gages and instruments, such as voltage and calibrating machines, tensiometer, tachometer, and densimeter. Patrols work area to detect operating defects. Inspects machine to determine cause of faulty operation and adjusts machine. Replaces worn and broken parts, such as spindles, rollers, guides, gears, pulleys, tape, and belts, using handtools. Lubricates moving parts and wearing surfaces, using oilcan and grease gun. May overhaul machines and plumb spindles, following plant schedule. May clean machines. May erect new machines [MILLWRIGHT (any ind.)]. May be designated according to machines maintained as CARD FIXER (textile); COMBER FIXER (textile); GARNETT FIXER (house furn.); GILL-BOX FIXER (textile); QUILLER-MACHINE FIXER (textile); SPINNING-FRAME FIXER (textile). Additional titles: TUFTING-MACHINE FIXER (carpet & rug); TWISTING-FRAME FIXER (textile); WINDER FIXER (textile); YARN-TEXTURING MACHINE FIXER (textile).

689.260-022 SECTION LEADER AND MACHINE SETTER, POLISHING (textile)

Sets up, repairs, and adjusts yarn polishing (glazing) machines: Mixes finishing solutions [CHEMICAL MIXER (textile)]. Separates thread packages according to color and type to prevent faulty mixing of customer orders.

689.685-050 CLOTH-DOUBLING-AND-WINDING-MACHINE OPERATOR (textile) doubling-and-rolling-machine operator; doubling-machine operator; wide-cloth folder.

Tends machine that folds (lengthwise) and winds cloth around cardboard center or *tube* / for shipment: Mounts roll of finished cloth onto brackets of machine, and threads end through guide rollers and over triangular folding device, or joins ends to form continuous lengths, using sewing machine. Places cardboard center or tube on winding spindles and starts cloth around cardboard center or tube. Starts machine and pulls uneven selvages into alinement as cloth is folded and wound. Turns handwheel to adjust folding attachment. Cuts out seams and defects marked by CLOTH EXAMINER, MACHINE (textile), using scissors or knife. Doffs full rolls when specified yardage has been wound. Feeds paper measuring tape into roll when winding cloth that stretches. May tend machine fed directly from another machine. May paste sticker showing yardage on outside of each bolt. May fold special lots of cloth by hand.

689.685-062 DROP-WIRE ALINER (textile)

Tends machine that alines *drop-wires* used on loom harnesses: Loads drop wires in machine chutes. Turns handwheel to secure electrostatic bar in machine bed. Starts machine and observes operation for clogs. Clears jams, using screwdriver. Removes bar and wires from machine and replaces damaged wires. Slides metal strip through drop wire eyelets to facilitate attachment to loom harness.

689.685-070 HEDDLE CLEANER, MACHINE (textile)

Tends machine that brushes lint from *heddles* in *harness frames:* Positions frame on feeding mechanism and starts machine that draws frame under brushes. Reverses position of frame on mechanism to complete cleaning cycle. Cleans machine and work area, using rags, broom, and airhose.

689.685-078 HOOKER-INSPECTOR (textile) cloth folder, machine; folding-machine operator; hooker operator; measuring-machine tender; yardage-machine operator; yarding-and-folding-machine operator.

Examines cloth for weaving or finishing defects, using *hooker machine* that folds cloth into yard lengths: Pushes roll of cloth onto machine brackets and threads cloth through feed rollers, over and under tension rollers, through slot of folding bar, and inserts end of cloth under clamps on machine table. Turns knob to set yardage counter or counts folds to determine yardage of cloth inspected. Depresses pedal to raise clamp, releasing cut of cloth, and removes cloth from machine. May complete folding of cloth by hand.

689.685-126 STITCH-BONDING-MACHINE TENDER (textile)

Tends machine that *stitch-bonds* fibrous web to produce reinforced nonwoven fabric: Positions *laps //* at feed end of machine and mats supply end to tailing end in machine. Starts machine and observes operation to detect defective stitching, thread breaks, and exhausting laps. Centers lap on feed apron to prevent lap edge from straying from stitching area. *Pieces up* thread breaks. Doffs machine. Cleans and lubricates machine.

689.686-014 BOBBIN-CLEANING-MACHINE OPERATOR (textile) bobbin-stripper; cop breaker; quill cleaner; quill-cleaning-machine operator; quill skinner; quill stripper; tailing hand.

Feeds machines that strip unused yarn from bobbins or *quills* by one of following methods: (1) Dumps bobbins into hopper of machine that strips yarn from bobbins with knives, brushes, and compressed air, using chain hoist. Pushes or pulls bobbins with rake to regulate flow of bobbins from hopper onto feed conveyor. Removes jammed bobbins or quills. (2) Dumps bobbins into tumblers that remove yarn from bobbins by agitation, using chain hoist. May transfer cleaned bobbins to storage area, using handtruck.

689.686-022 DOFFER (textile)

Doffs bobbins of yarn from spindles of spinning, twisting, or roving (slubber) frames: Stops machine and presses pedal to lower ring bar, allowing yarn to wind around base of spindle to facilitate restarting. Removes full bobbins of yarn from machine spindles, deposits yarn in handtruck, and replaces full bobbins with empty bobbins. Releases pedal to raise ring bar, starts machine, and *pieces up* breaks in *roving* or ties breaks in yarn ends. Applies grease or oil to rings, using finger or oilcan. May change *travelers* [TRAVELER CHANGER (textile)]. May brush waste from machine. May be designated according to machine doffed as SLUBBER DOFFER (textile); SPINNING DOFFER (textile); TWISTER DOFFER (textile).

689.686-034 NEEDLE-PUNCH-MACHINE-OPERATOR HELPER (textile)

Offbears rolls of nonwoven fabric (blanketing) from *stitch-bonding* machine: Observes fabric winding into rolls to detect defects. Cuts defective fabric from roll, using scissors, and joins ends together with needle and thread. Doffs full rolls, using chain hoist.

689.687-030 CREELER (any ind.)

Creels looms, twisters, warpers, tufting, or other textile machine to change style of yarn or to replace exhausted yarn packages: Places yarn packages on spindle of *creel* and threads yarn through eyelet plate (yarn guides) or ties yarn ends to ends of yarn from

preceeding package. Removes old yarn from machines before changing to different size or type of yarn. Cleans dust and lint from creel. May repair yarn breaks in creel. May replace yarn packages or spools when faulty yarn appears.